SERVICE MANUAL

SM-11

marantz®

model Sm-11

Stereo Power Amplifier

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.
Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quanties required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

TECHNICAL ASSISTANCE

Should you require any other technical support, do not hesitate to contact the Technical Department of
MARANTZ INTERNATIONAL
Quality & Service Dept.
80, Rue des Deux Gares,
B-1070 Brussels
Belgium
Phone: 02/525.70.22 or 525.70.23
Telefax: 02/525.6160
Telex: 23550 OR
61511 (PHEMB) routing: BELDMZT

PARTS ORDERING

Parts may be ordered at the following addresses:

AUSTRIA
HORNYPHON
Vertriebsgesellschaft GmbH
Wienerbergstrasse 1
A 1101 Wien
Austria
Telex: 132.332

AUSTRALIA
MARANTZ AUSTRALIA
PTY., Ltd.
19 Chard Road
Brookvale, NSW 2100
Australia
Telex: 24121

BELGIUM
SVD DIVISION MARANTZ
Industrialaan 1
1720 Groot-Bijgaarden
Belgium
Telex: 24466

CHILE
MARANTZ
DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.239

DENMARK
MARANTZ
DIVISION OF PHILIPS
SERVICE A/S
Prags Boulevard 80
Postbox 1919
DK-2300 København S
Denmark
Telex: 31201

FINLAND
MARANTZ
DIVISION OF OY PHILIPS Ab
Kaivokatu 8
00100 Helsinki
Finland
Telex: 124811

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

GERMANY
MARANTZ GERMANY GmbH
Max-Planck-Strasse 22
6072 Dreieich 1
Germany
Telex: 529821

THE NETHERLANDS
Elpro b.v.
De Limiet 3
4131 NR Vianen
The Netherlands
Telex: 47679

NORWAY
MARANTZ
DIVISION OF PHILIPS A/S
Sandstuveien 40
Oslo 6
Norway
Telex: 72640

GREAT BRITAIN
MARANTZ AUDIO U.K. Ltd
Unit 15/16
Saxon Way Industrial Estate
Moor Lane
Harmondsworth UB7 OLW
Great Britain
Telex: 935196

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocratus Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 201530

SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Rainer House
Ove Street, 10
Doornfontein
Johannesburg
Telex: 483.456

SPAIN
PHONO S.A.
Ignacio Iglesias 10
Badalona (Barcelona)
Spain
Telex: 59355

SWEDEN
MARANTZ
DIVISION OF PHILIPS
Försäljning AB
Tegeluddsvägen 1
S-115 84 Stockholm
Sweden
Telex: 14060

SWITZERLAND
DYNAVOX ELECTRONICS
Route de Villars 105
1701 Fribourg
Switzerland
Telex: 942377

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

U.S.A.
MARANTZ COMPANY, Inc.
National Service Department
P.O.Box 577
Chatsworth, CA 91311
U.S.A.

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

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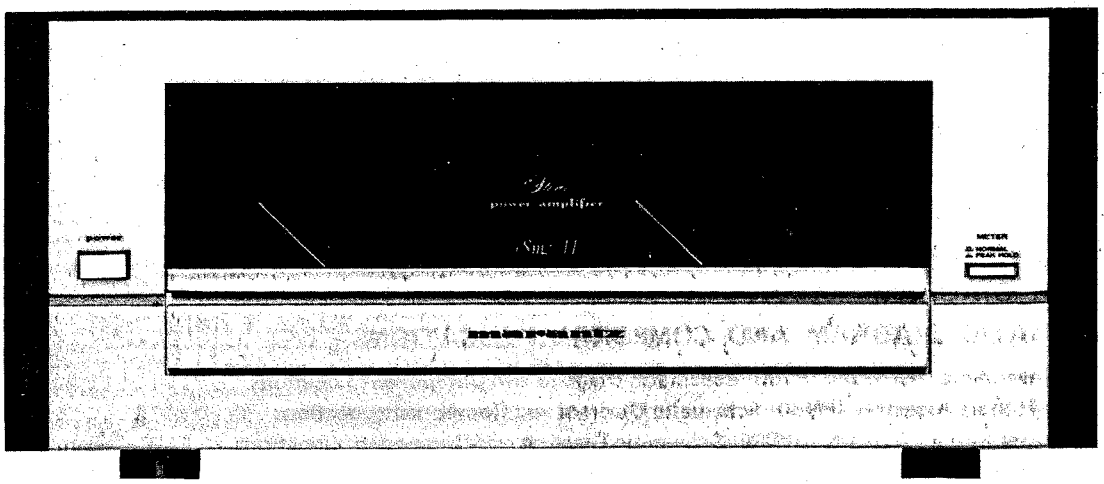
MARANTZ MODEL Sm-11 STEREO POWER AMPLIFIER



INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for the Marantz Model Sm-11 Stereo Power Amplifier.

Servicing information and voltage data included in this manual are intended for use by knowledgeable and experienced personnel only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of circuitry operation.

The parts list furnishes complete ordering information. Most replacement parts should be ordered from the Marantz Company. However, a simple description is included for parts which can be obtained locally.

1. FEATURES

High Power Achieves Dynamic Sound

- The output stage features four high linearity power transistors connected in parallel in a three stage Darlington configuration. The total of 16 power transistors used achieves high output levels with power to spare.
- This enables the loads imposed on each transistor to be dispersed and minimized, thus maintaining the initial performance and increasing the lifespan of the unit.

Large Size Peak Power Meter

- As should be true of every professional quality high class amplifier, the Sm-11 features a large size peak power meter that indicates the output level.
- Since this large size peak power meter uses a logarithm compression circuit, output monitoring from low to high power is possible without requiring any switching of the range.
- The NORMAL/PEAKHOLD switch on the front panel enables you to choose from either peak hold or normal power meter output monitoring.

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Computer Grade High Quality Screw Terminal

- The Sm-11 features a powerful power supply section, which uses a high regulation oversize power transformer as well as custom audio large capacity electrolytic capacitors that were specially designed for the Sm-11.
- The Sm-11 features high efficiency heat sinks to effectively disperse the thermal radiation from the power transistors caused by continuous high power output.

Remote-Equipped AC Cord

- In order to prevent noise, a large current should not be passed through the preamplifier. The large current required by the main amplifier is taken directly from the household AC power supply, but by connecting the remoteequipped AC cord of the main amplifier to the preamplifier, the Sm-11 succeeds in limiting the amount of current passing through the preamplifier.
  Since a large current is not being passed directly through the preamplifier, the Sm-11 minimizes noise and improves the overall sound quality.
  This remote-equipped AC cord can also be used together with an audio timer.

2. P.W. BOARDS

As can be seen from the circuit diagram the chassis of Model Sm-11 consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Power Amp. . . . . mounted on P.W. Board P700
2. Transistor . . . . . mounted on P.W. Board P770
3. Power Supply . . . . . mounted on P.W. Board P800
4. Soft Start . . . . . mounted on P.W. Board PN50
5. Meter Switch . . . . . mounted on P.W. Board PS00
6. Meter Lamp . . . . . mounted on P.W. Board PZ01

3. TEST EQUIPMENT REQUIRED FOR SERVICING

Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
AC VTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Circuit Tester	Trouble shooting
DC VTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to amplifier
Line Voltmeter	Monitors potential of primary power to amplifier
Variable Autotransformer (0 ~ 140V AC, 10A)	Adjust level of primery power to amplifier
Shorting Plug	Shorts amplifier input to eliminate noise pickup

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4. ADJUSTMENT PROCEDURES

Power Transistor Idling Adjustment

1. Set the input and the output of the unit to OPEN.
2. Connect a digital voltmeter between J775 and J776 of the connection circuit board for the L-ch power transistors.
   Adjust R735 so that the reading is 7.2 mV.
   Adjust the R-ch in the same manner.

   Note: Wait for a few minutes, and then readjust the unit.

Output DC Offset Adjustment

1. Set the input and the output of the unit to OPEN.
2. Connect a digital voltmeter to the speaker terminals of both the R-ch and the L-ch. Adjust R712 so that the DC voltage of the speaker terminals is within ±15 mV.

   Note: Since the variable range is quite large, depending on the position of the potentiometer, the relay will not go on if the offset voltage exceeds 700 mV.

Power Meter Mechanical Zero Adjustment

Insert a small minus screwdriver into the small holes on the underside of the front panel, and carry out this adjustment by gradually moving the meter zero adjustment lever towards the left or the right.

Note: The meter indicators will not correspond to zero if the zero adjustment is carried out when the unit is tilted or placed upside down. Be sure that the Sm-11 is in its normal position of operation before making this adjustment.
The meters of the Sm-11 have been zero adjusted before leaving the factory.

Power Meter 0 dB Adjustment

Set the speaker terminal voltage of both the R-ch and the L-ch to 40 V. Adjust RX05 and RX06 so that the meter reading is 0 dB, and coincides with the 200 W line.

Note: Because of the meter IC used in the Sm-11, adjusting the L-ch and the R-ch can result in mutual interferance of the meter reading. It is therefore necessary to adjust RX05 and RX06 in alternation.

5. CIRCUITRY EXPLANATION

Soft Start Remote Operation Circuit

Since the switching on and off of the main power is accomplished by LN51, the Sm-11 can be operated remotely by turning on and off the power that causes LN51 to operate. When relay LN51 goes on, voltage will be supplied to the Soft Start circuit, and LN52 will go on about 0.3 – 0.5 sec. later.
Until LN52 goes on, RN52 limits the current and prevents a current inrush surge. Once LN52 is completely on, power will be supplied to the power transformer, reagardless of LN51.
Both LN51 and LN52 have to go off in order for the power to be turned off. QN51 is the photocoupler that turns LN52 off.

After Servicing Notes

- The Soft Start circuit board is on the AC primary side. Be sure that both power cupply cords are disconnected before servicing this unit.
- Gradually increasing the primary voltage by using a slidak or a similar variable power source can result in burnout of the Soft Start resistor RN52. Please observe the following procedure.

1. Connect the JN55 side of J001 and JN56 together with a wire.
2. Connect W001 (main power cord) to the secondary side of the slidak and gradually increase the voltage.

Note: In this condition the switch will always be on, regardless of the unit's power switch or remote power supply.

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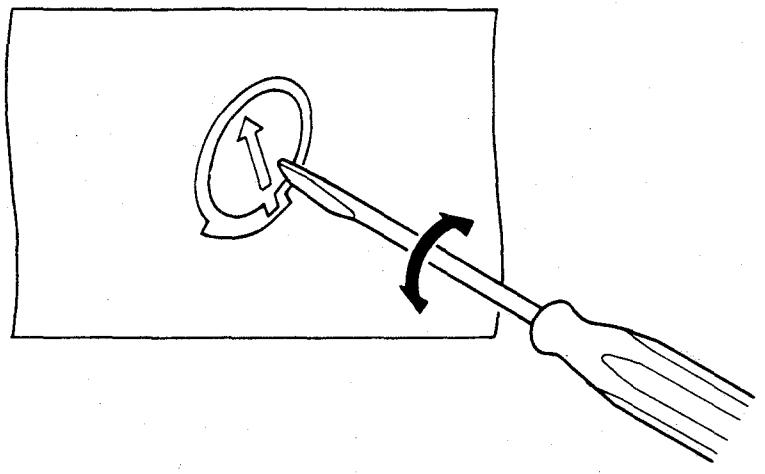
6. VOLTAGE CONVERSION

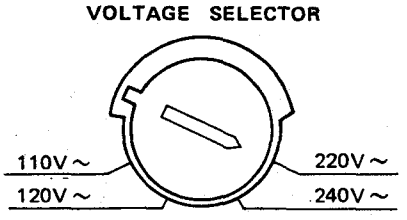
• EUROPEAN MODEL ONLY

To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

CAUTION
DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.

Voltage Conversion Chart





Note on safety: Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

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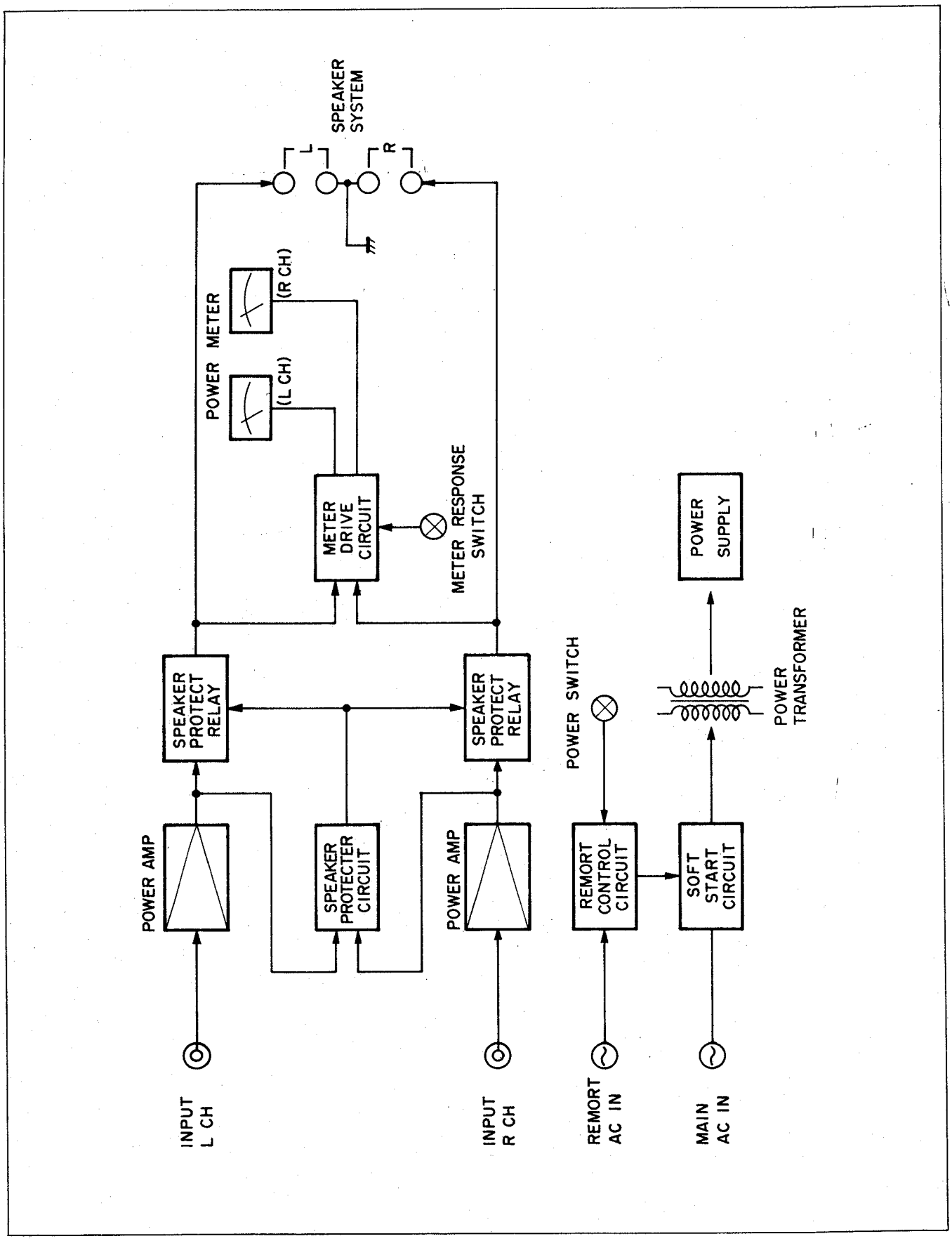
7. BLOCK DIAGRAM



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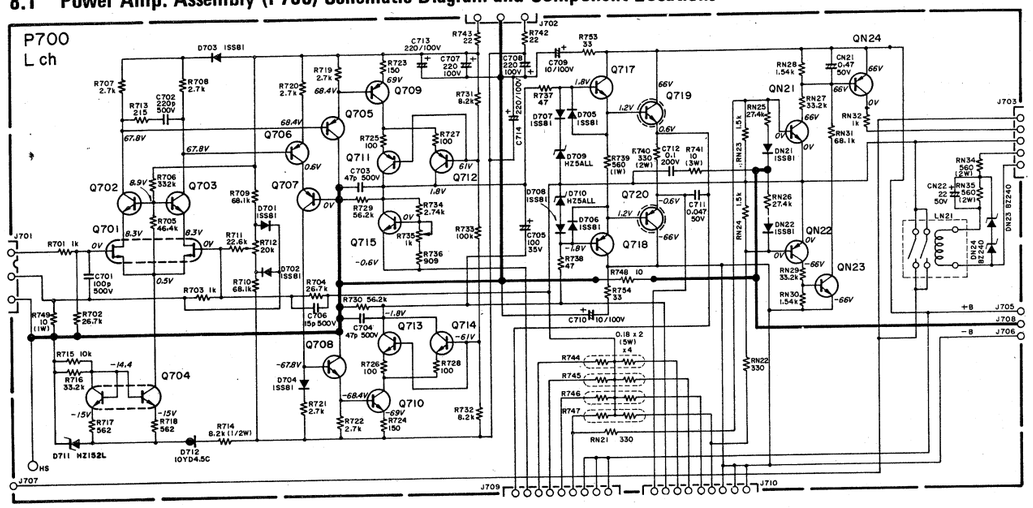
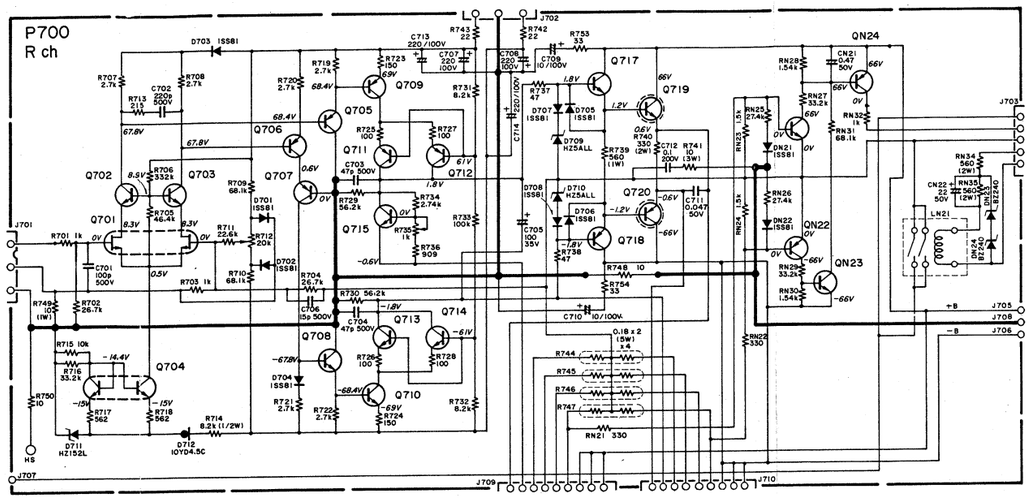
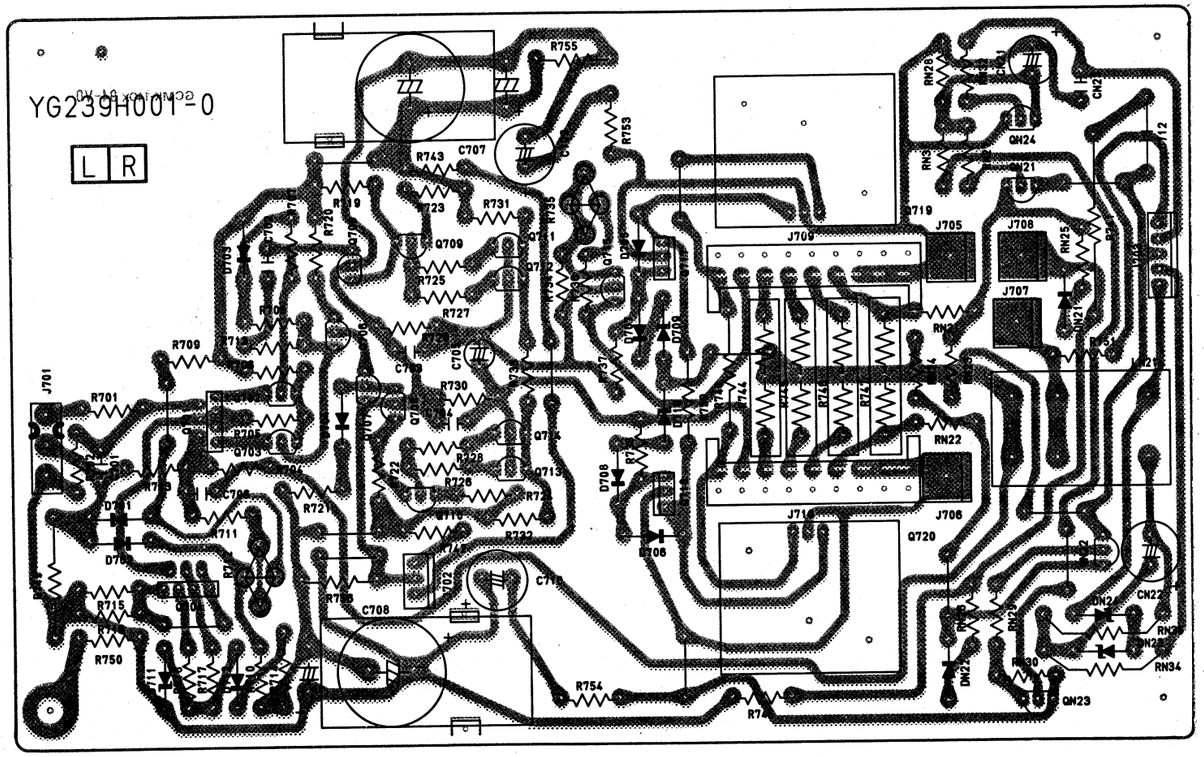
8. SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS

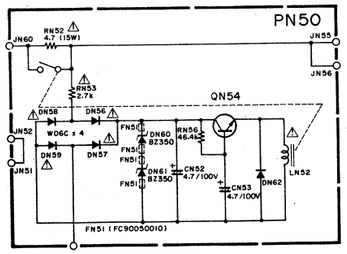
8.1 Power Amp. Assembly (P700) Schematic Diagram and Component Locations

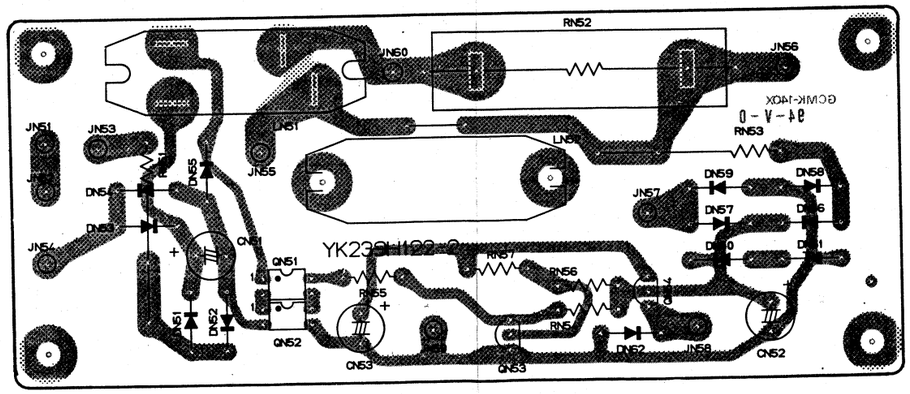




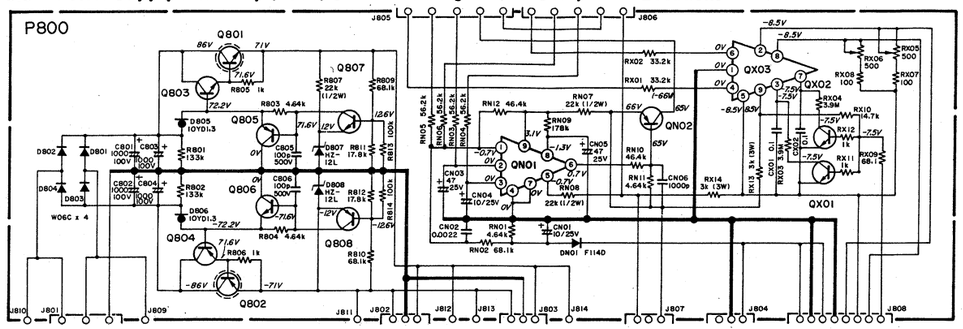


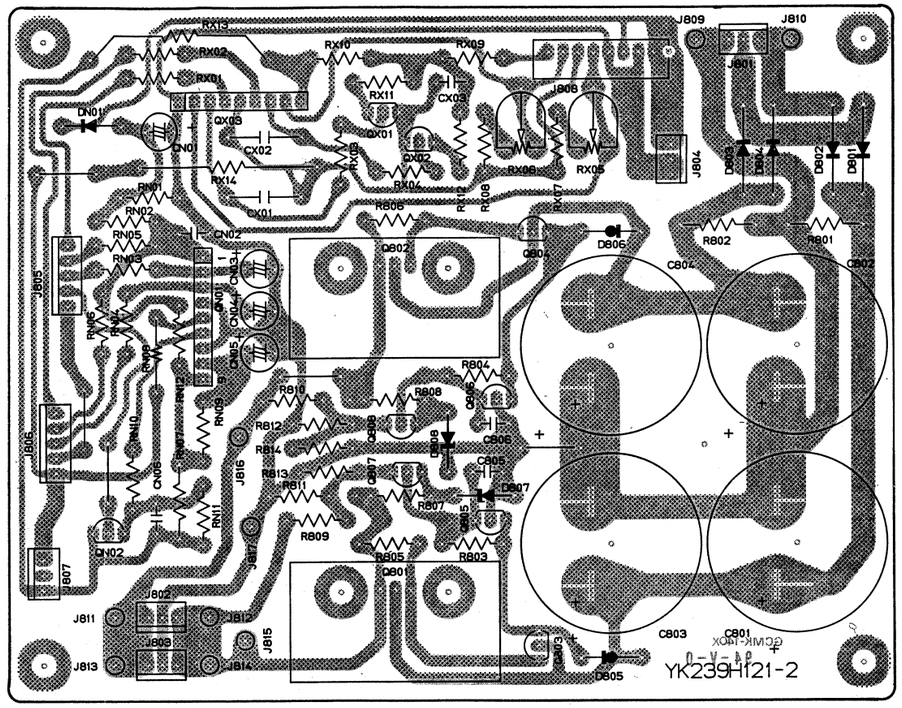
8.2 Soft Start Assembly (PN50) Schematic Diagram and Component Locations



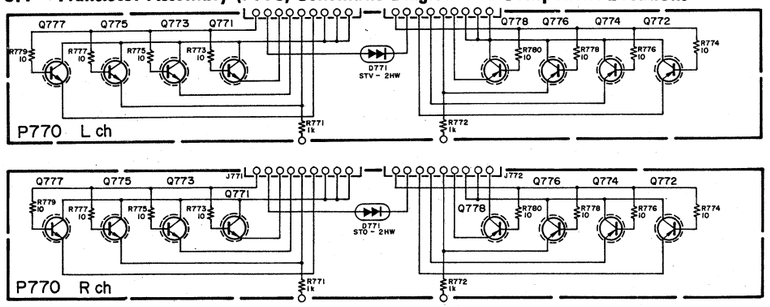


8.3 Power Supply Assembly (P800) Schematic Diagram and Component Locations

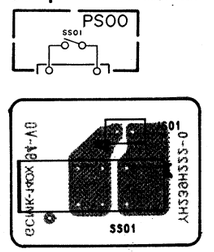




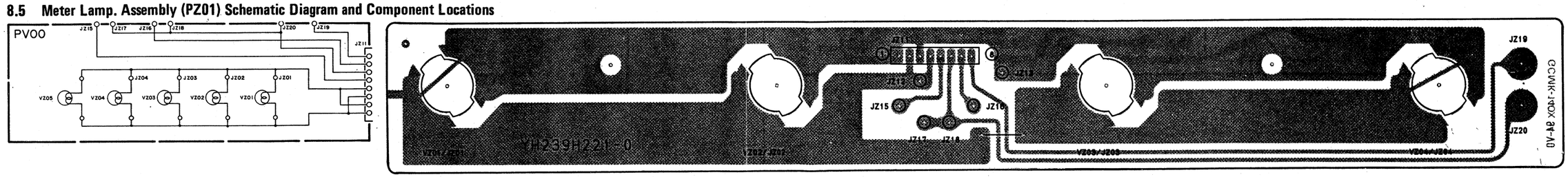
8.4 Transistor Assembly (P770) Schematic Diagram and Component Locations



8.6 Meter Switch Assembly (PS00) Schematic Diagram and Component Locations



8.5 Meter Lamp. Assembly (PZ01) Schematic Diagram and Component Locations



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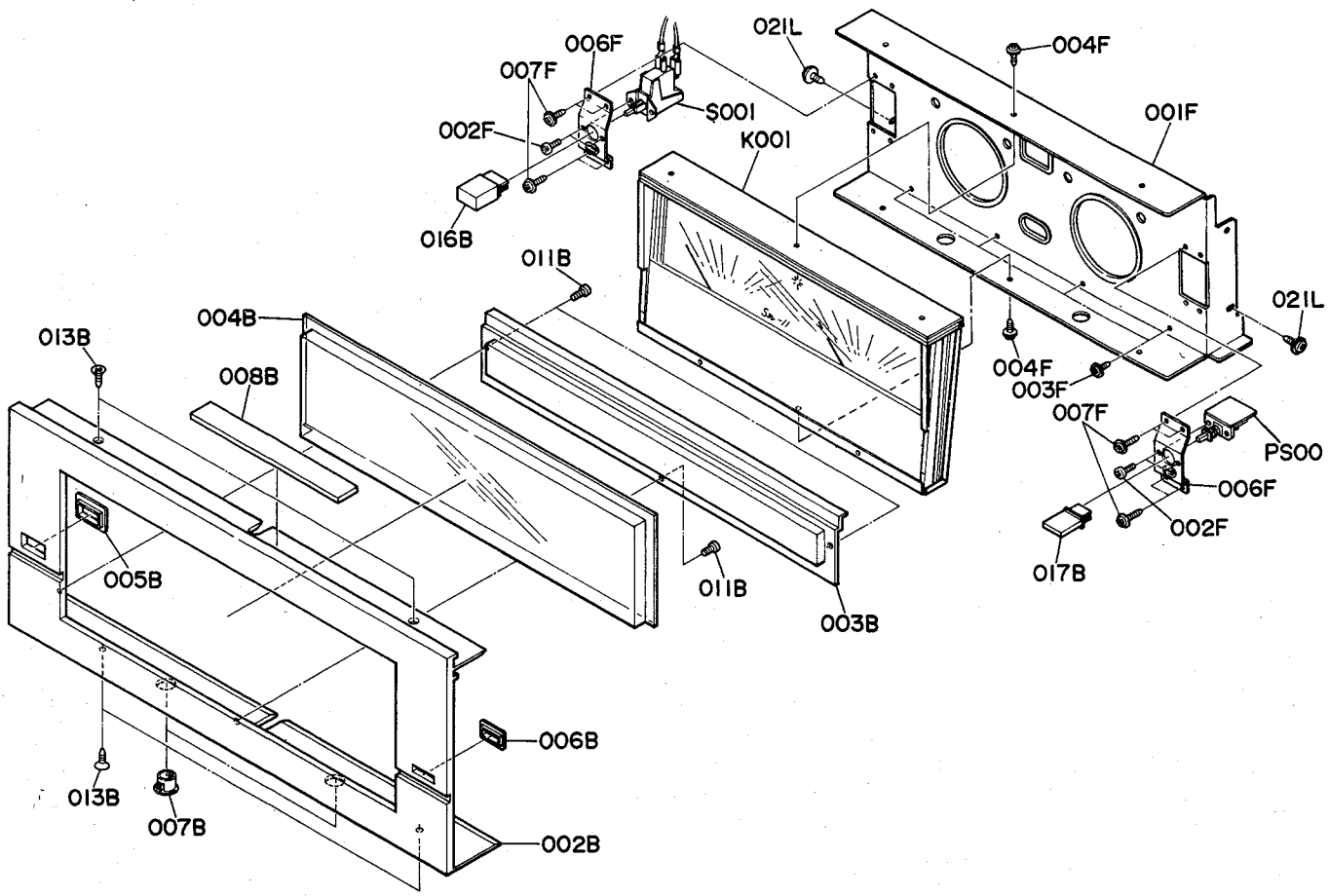
9. EXPLODED VIEW AND PARTS LIST

- [C01-99] Front Panel & Front Chassis



REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
A	1	1	239H248400	Front Panel Assembly
002B	1	1	239H248010	Front Panel
003B	1	1	239H063010	Escutcheon, Sub Panel
004B	1	1	239H158010	Window, Glass
005B	1	1	239H259010	Bushing, Power Switch
006B	1	1	239H259020	Bushing, Meter
007B	2	2	239H259030	Bushing, Meter Adjust Cover
008B	1	1	239H056020	Buffer
011B	3	3	51100305A9	B.H.M. Screw B3 x 5
013B	4	4	51040306M9	F.H.M. Screw F3 x 6

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
016B	1	1	239H270010	Button, Power
017B	1	1	239H270020	Button, Meter
001F	1	1	239H105020	Chassis, Front
002F	4	4	51480306M9	F. Washer Screw F3 x 6
003F	4	4	51260408M0	B.T. Screw B4 x 8
004F	2	2	51480305Z9	F. Washer Screw F3 x 5
006F	2	2	239H160070	Bracket, Push Switch
007F	8	8	51260308M0	B.T. Screw B3 x 8
021L	2	2	51260412Z0	B.T. Screw B4 x 12
⚠S001	1	1	SP01010810	Push Switch, Power
K001	1	1	239H302510	Meter Assembly

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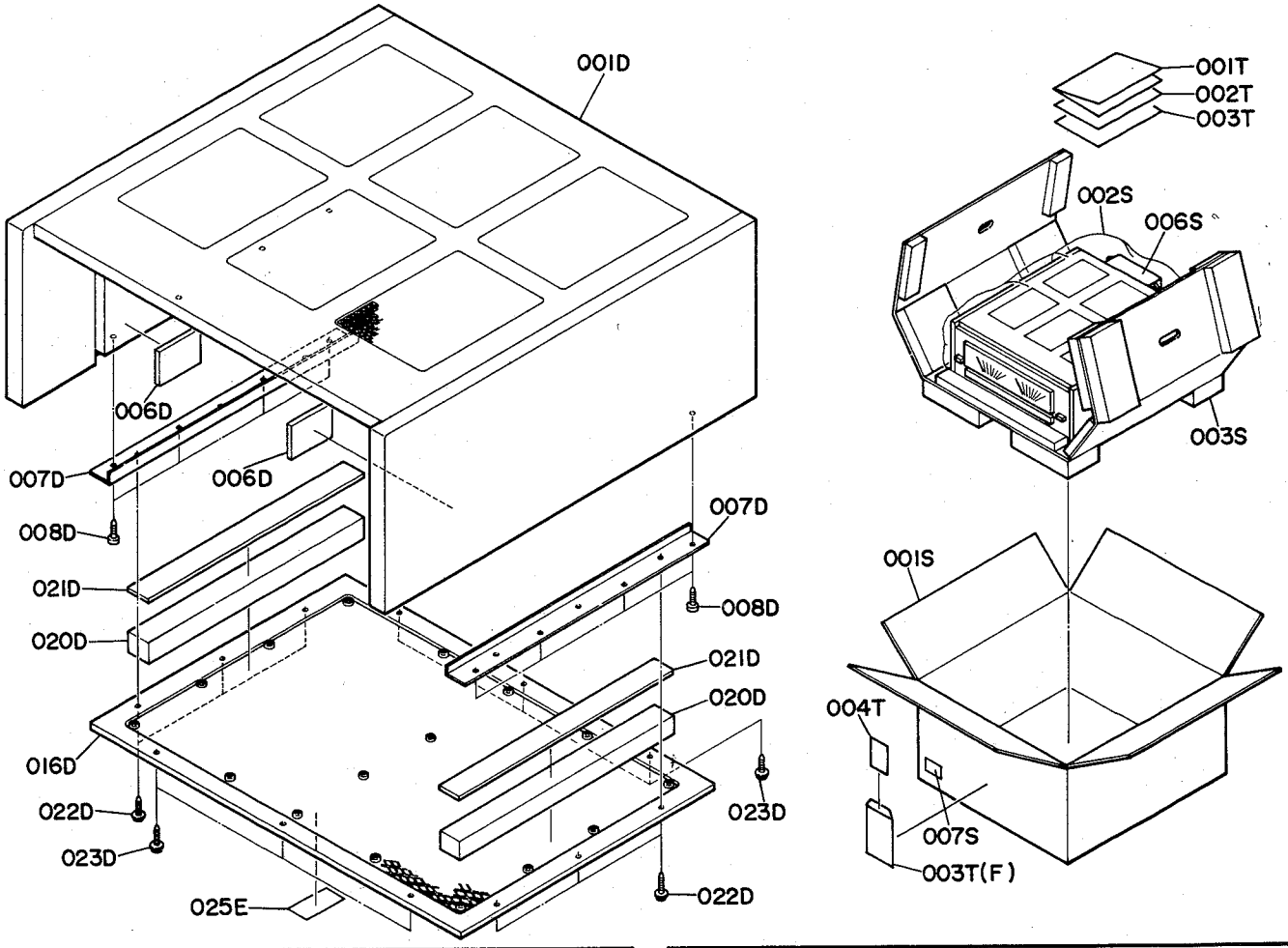
● [H01-99] Wood Case & Packing Materials



REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
001D	1	1	239H072510	Case Assembly, Wood
006D	2	2	239H056010	Buffer
007D	2	2	239H160090	Bracket, Wood Case
008D	8	8	51523125M0	R.H. Wood Screw
016D	1	1	239H257510	Lid Assy, Bottom
020D	2	2	239H118010	Spacer
021D	2	2	239H056080	Buffer
022D	6	6	51260420M0	B.T. Screw B4 x 20
023D	6	6	51260420M0	B.T. Screw B4 x 20
025E	1		2911861110	Label

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
001S	1	1	239H801010	Packing Case
002S	1	1	9015050450	Polyethylene Bag
003S	1	1	239H809010	Cushion
006S	1	1	2864804010	Sleeve
007S	8		9526019060	Serial No. Card
007S		2	9526019040	Serial No. Card
001T	1		239H851310	User Manual
001T		1	239H851110	User Manual
002T	1		239H851320	User Manual, Spec
002T		1	9631000130	Warranty Card
003T	1		239H856010	Circuit Diagram
003T		1	128T854010	Warranty Card
004T		1	9611000030	User's Card

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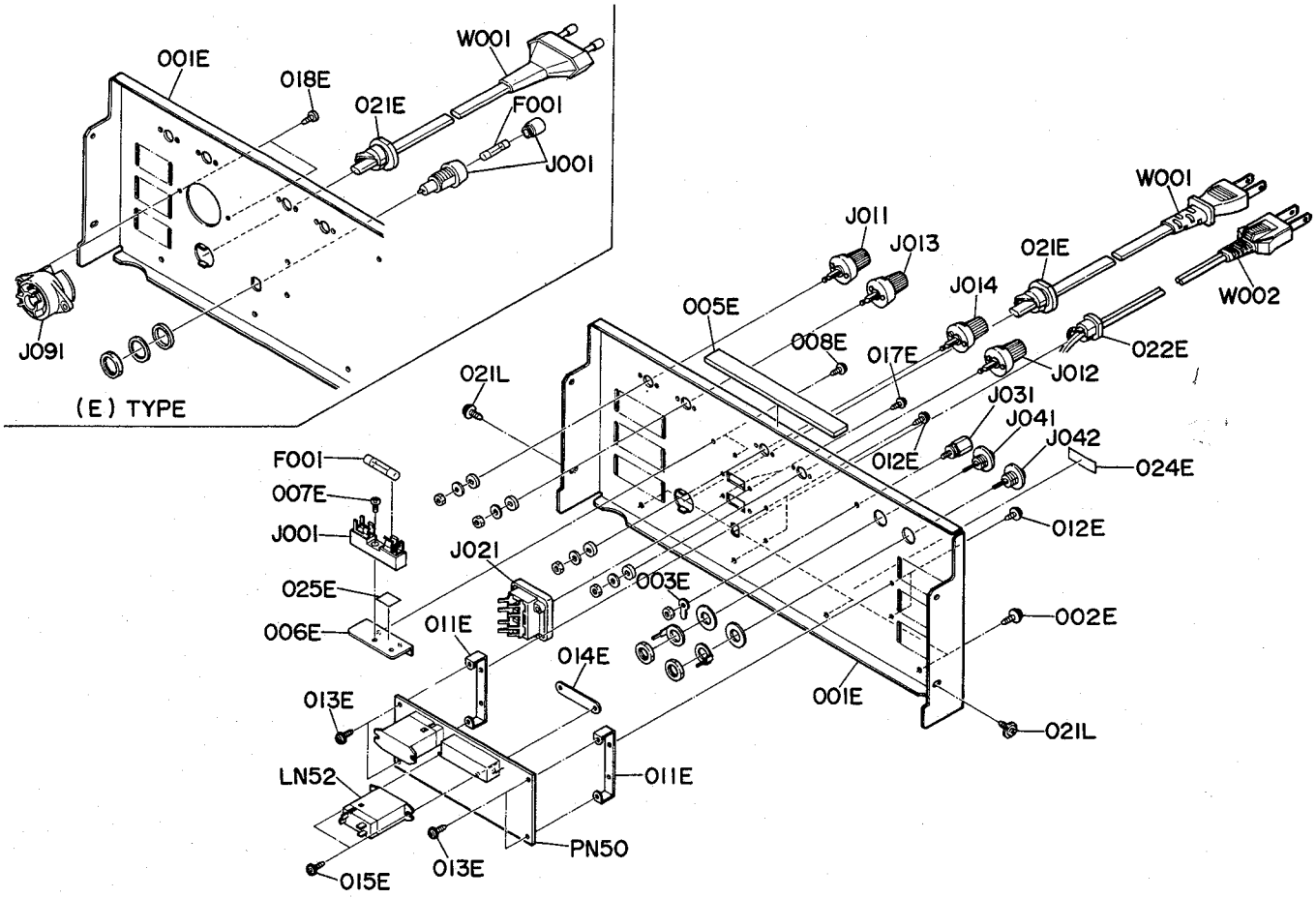
● [P01-99] Rear Panel



REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
001E	1		239H250020	Bracket, Rear Panel
001E		1	239H250010	Bracket, Rear Panel
002E	4	4	51260408M0	B.T. Screw B4 x 8
003E	1	1	54050400R0	T.L. Washer, OR
005E	1	1	239H056030	Buffer
006E		1	239H160030	Bracket, Fuse Holde
007E		1	51100308Z9	B.H.M. Screw B3 x 8
008E		2	51480308M9	F. Washer Screw F3 x 8
011E	2	2	239H160060	Bracket
012E	4	4	51480308M9	F. Washer Screw F3 x 8
013E	4	4	51480308M9	F. Washer Screw F3 x 8
014E	1	1	239H160050	Bracket, Relay
015E	2	2	51280308M0	B.H. Tapped Screw B3 x 8
017E		2	51280308M0	B.H. Tapped Screw B3 x 8
018E	2		51260308M0	B.T. Screw B3 x 8
021E	1	1	1455259120	Bushing, AC Cord
022E		1	1455259070	Bushing, AC Cord; Sub
024E	1	1	2112265010	Indicator, Serial No.
025E		1	9510611100	Label, Fuse
021L	2	2	51260412Z0	B.T. Screw B4 x 12

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
⚠ F001	1		FS10500800	Fuse 15A
⚠ F001		1	FS11000600	Fuse 10A
⚠ J001	1		YJ08000290	Jack, Fuse Holder
⚠ J001		1	YJ08000380	Jack, Fuse Holder
J011	1	1	YT01010100	Terminal, SPK (L)
J012	1	1	YT01010100	Terminal, SPK (R)
J013	1	1	YT01010110	Terminal, SPK (L)
J014	1	1	YT01010110	Terminal, SPK(R)
⚠ J021		1	YJ04001120	Jack, AC Outlet (2P)
J031	1	1	YT01010050	Terminal, GND
J041	1	1	YT02010190	Terminal, Input (L)
J042	1	1	YT02010190	Terminal, Input (R)
⚠ J091	1		BY05080050	Voltage Selector
⚠ W001	1		YC01900090	A.C. Power Cord
⚠ W001		1	YC01800240	A.C. Power Cord, Main
⚠ W002		1	YC02400180	A.C. Power Cord, Remort
⚠ LN52	1	1	LY10480020	Relay, TV48D1-F
C715	1	1	DF16104510	Film 0.1μF ±10% (J011–J013)
C716	1	1	DF16104510	Film 0.1μF ±10% (J012–J014)
R755	1	1	GJ05100030	Resistor 10Ω 3W (J011–J013)
R756	1	1	GJ05100030	Resistor 10Ω 3W (J012–J014)

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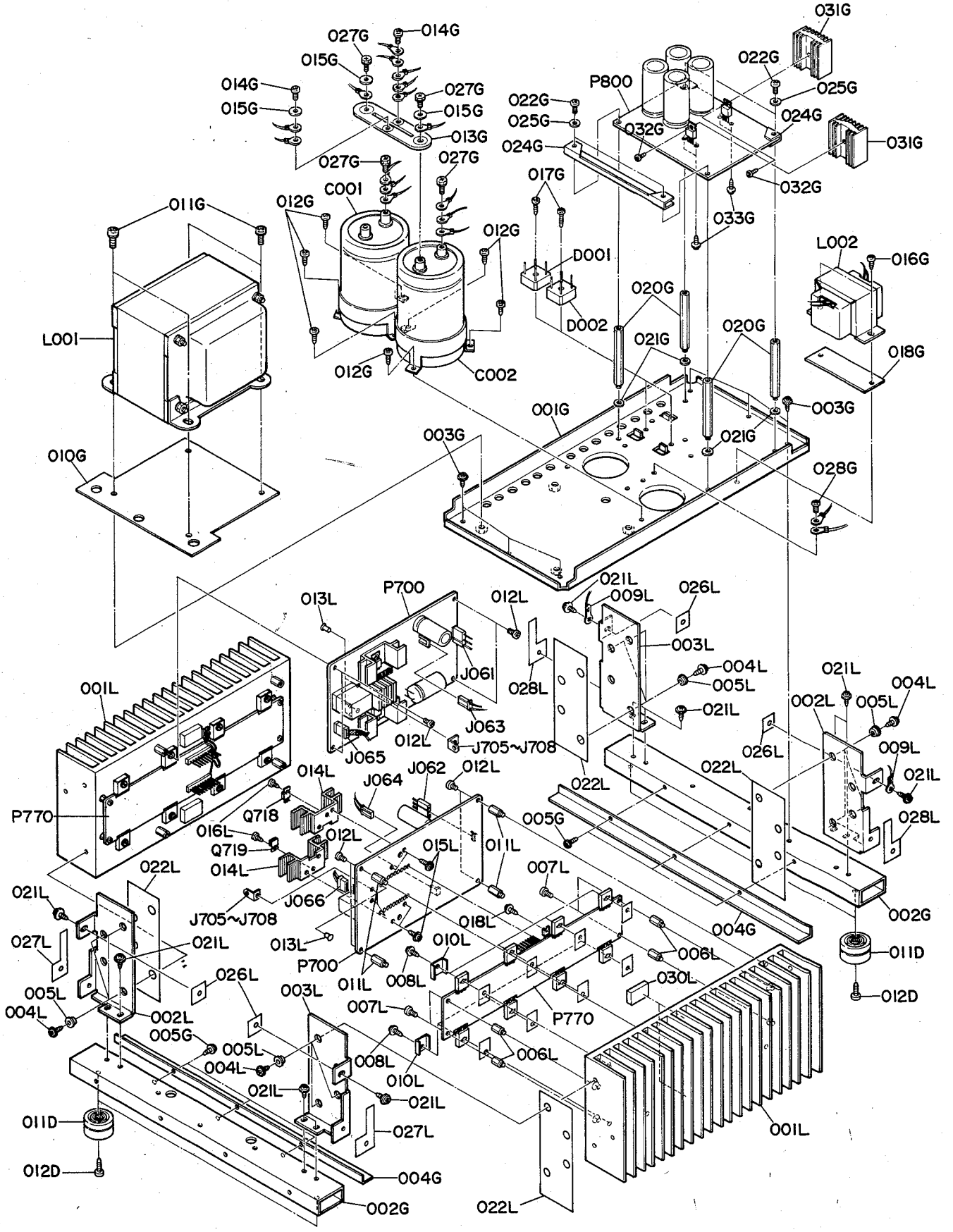
● [P02-99] Main Chassis



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REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION	
011D	4	4	239H057010	Leg	
012D	4	4	51260420M0	B.T. Screw	B4 x 20
001G	1	1	239H105010	Chassis, Main	
002G	2	2	239H126010	Stay	
003G	6	6	51260408M0	B.T. Screw	B4 x 8
004G	2	2	239H160040	Bracket	
005G	6	6	51260308M0	B.T. Screw	B3 x 8
010G	1	1	239H120150	Insulator	
011G	4	4	51490612M9	L. Washer Screw	L6 x 12
012G	6	6	51280406M0	B.H. Tapped Screw	B4 x 6
013G	1	1	239H123010	Contactor, Earth	
014G	2	2	51100408M9	B.H.M. Screw	B4 x 8
015G	2	2	239H118020	Spacer	
016G	2	2	51280406M0	B.H. Tapped Screw	B4 x 6
017G	2	2	51280415M0	B.H. Tapped Screw	B4 x 15
018G	1	1	239H120160	Insulator	
020G	4	4	239H101010	Support	
021G	4	4	54040402N0	Spring Washer	
022G	4	4	51480308M9	F. Washer Screw	F3 x 8
024G	2	2	239H104010	Retainer	
025G	4	4	54110149M0	Flat Washer, L	
027G	4	4	51100612M9	B.H.M. Screw	B6 x 12
028G	1	1	51100408M9	B.H.M. Screw	B4 x 8
031G	2	2	206H267010	Heatsink	
032G	2	2	51280308M0	B.H. Tapped Screw	B3 x 8
033G	4	4	51260308M0	B.T. Screw	B3 x 8
001L	2	2	239H267010	Heatsink, Main	
002L	2	2	239H160010	Bracket	
003L	2	2	239H160020	Bracket	
004L	12	12	51280412M0	B.H. Tapped Screw	B4 x 12
005L	12	12	239H055010	Collar	
006L	8	8	239H101020	Support	
007L	8	8	51480306M9	F. Washer Screw	F3 x 6
008L	16	16	51260312M0	B.T. Screw	B3 x 12
009L	2	2	62030049W0	Lug	
010L	16	16	239H053030	Cover, Power TR	
011L	8	8	239H101030	Support	
012L	8	8	51400306M9	F. Washer Screw	F3 x 6
013L	8	8	55060304B0	T.R. Rivet	
014L	4	4	239H267030	Heatsink	
015L	8	8	51260308M0	B.T. Screw	B3 x 8
016L	4	4	51280308M0	B.H. Tapped Screw	B3 x 8
018L	2	2	51260312M0	B.T. Screw	B3 x 12
021L	12	12	51260408M0	B.T. Screw	B4 x 8
022L	4	4	239H120110	Insulator	
026L	4	4	239H120030	Spacer	
027L	2	2	239H120040	Spacer	
028L	2	2	239H120050	Spacer	
030L	4	4	239H056040	Buffer	

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
⚠C001	1	1	EC27908010	Elect Cap. 2700μF 80V
⚠C002	1	1	EC27908010	Elect Cap. 2700μF 80V
⚠D001	1	1	HE20011100	Diode PB102F
⚠D002	1	1	HE20011100	Diode PB102F
⚠L001	1		TS63303080	Power Transformer, Main
⚠L001		1	TS63303070	Power Transformer, Main
⚠L002	1		TS15708080	Power Transformer
⚠L002		1	TS15708070	Power Transformer
Q718	1	1	HT111423A0	Transistor 2SA1142(P, Q or E)
Q719	1	1	HT322382C0	Transistor 2SC2238(O or Y)
JP01	1	1	YB00180190	Connective Cord
J061	1	1	YJ06001040	Jack, J701(L)
J062	1	1	YJ06001040	Jack, J701(R)
J063	1	1	YB05800020	Connective Cord, J702(L)
J064	1	1	YB03200040	Connective Cord, J702(R)
J065	1	1	YB06800020	Connective Cord, J703(L)
J066	1	1	YB04600010	Connective Cord, J703(R)
J705	1	1	YL09010190	Terminal
J706	1	1	YL09010190	Terminal
J707	1	1	YL09010190	Terminal
J708	1	1	YL09010190	Terminal

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10. ELECTRICAL PARTS LIST

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
				P700-POWER AMP CIRCUIT BOARD
P700	1	1	YG239H0010	P.W. Board, Power Amp
	1		ZZ239H8010	P.W. Board Assembly
				P700-CAPACITORS
C701	1	1	DF35101520	Mica 100pF ±5%
C702	1	1	DF35221520	Mica 220pF ±5%
C703	1	1	DF35470520	Mica 47pF ±5%
C704	1	1	DF35470520	Mica 47pF ±5%
C705	1	1	EA10703560	Elect 100μF 35V
C706	1	1	DF35150520	Mica 15pF ±5%
C707	1	1	EA22710060	Elect 220μF 100V
C708	1	1	EA22710060	Elect 220μF 100V
C709	1	1	EA10610050	Elect 10μF 100V
C710	1	1	EA10610050	Elect 10μF 100V
C712	1	1	DF15473010	Film 0.047μF ±5%
C715	1	1	DF16104510	Film 0.1μF ±10%
C716	1	1	DF16104510	Film 0.1μF ±10%
				P700-RESISTORS (All Resistors are ±5% and ¼W)
R701	1	1	GM21410010	1KΩ ±2%
R702	1	1	GM21426720	26.7KΩ ±2%
R703	1	1	GM21410010	1KΩ ±2%
R704	1	1	GM21426720	26.7KΩ ±2%
R705	1	1	GM21446420	46.4KΩ ±2%
R706	1	1	GM21433230	332KΩ ±2%
R707	1	1	GG05272140	2.7KΩ
R708	1	1	GG05272140	2.7KΩ
R709	1	1	GM21468120	68.1KΩ ±2%
R710	1	1	GM21468120	68.1KΩ ±2%
R711	1	1	GM21422620	22.6KΩ ±2%
R712	1	1	RA02030240	20KΩ(B), Trimming
R713	1	1	GM21421500	215Ω ±2%
R714	1	1	GG05822120	8.2KΩ ½W
R715	1	1	GM21410020	10KΩ ±2%
R716	1	1	GM21433220	33.2KΩ ±2%
R717	1	1	GM21456200	562Ω ±2%
R718	1	1	GM21456200	562Ω ±2%
R719	1	1	GG05272140	2.7KΩ
R720	1	1	GG05272140	2.7KΩ
R721	1	1	GG05272140	2.7KΩ
R722	1	1	GG05272140	2.7KΩ
R723	1	1	GG05151140	150Ω
R724	1	1	GG05151140	150Ω
R725	1	1	GG05101140	100Ω
R726	1	1	GG05101140	100Ω
R727	1	1	GG05101140	100Ω
R728	1	1	GG05101140	100Ω
R729	1	1	GM21456220	56.2KΩ ±2%
R730	1	1	GM21456220	56.2KΩ ±2%
R731	1	1	GG05822140	8.2KΩ
R732	1	1	GG05822140	8.2KΩ
R733	1	1	GM21410030	100KΩ ±2%
R734	1	1	GM21427410	2.74KΩ ±2%
R735	1	1	RA05010270	500Ω(B), Trimming
R736	1	1	GM21490900	909Ω ±2%
R737	1	1	GG05470140	47Ω
R738	1	1	GG05470140	47Ω
R739	1	1	GA05561010	560Ω 1W
R740	1	1	GA05331020	330Ω 2W

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION
R741	1	1	GA05100030	10Ω 3W
R742	1	1	GG05220140	22Ω 3W
R743	1	1	GG05220140	22Ω 3W
R744	1	1	BW10000080	0.18Ω 5W x 2, Compo.
R745	1	1	BW10000080	0.18Ω 5W x 2, Compo.
R746	1	1	BW10000080	0.18Ω 5W x 2, Compo.
R747	1	1	BW10000080	0.18Ω 5W x 2, Compo.
R748	1	1	GG05100140	10Ω
R749	1	1	GG05100140	10Ω
R751	1	1	GM21410000	100Ω
R753	1	1	GG05330140	33Ω
R754	1	1	GG05330140	33Ω
R755	1	1	GJ05100030	10Ω 3W
R756	1	1	GJ05100030	10Ω 3W
				P700-SEMICONDUCTORS
Q701	1	1	HF203892A0	F.E.T. 2SK389(GR or BL)
Q702	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q703	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q704	1	1	HT333812A0	Transistor 2SC3318(GR or BL)
Q705	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q706	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q707	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q708	1	1	HT322402A0	Transistor 2SC224(GR or BL)
Q709	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q710	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q711	1	1	HT111452A0	Transistor 2SA1145(O or Y)
Q712	1	1	HT111452A0	Transistor 2SA1145(O or Y)
Q713	1	1	HT327052A0	Transistor 2SC2705(O or Y)
Q714	1	1	HT327052A0	Transistor 2SC2705(O or Y)
Q715	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q717	1	1	HT326823A0	Transistor 2SC2682(P, Q or E)
Q718	1	1	HT111423A0	Transistor 2SA1142(P, Q or E)
Q719	1	1	HT322382C0	Transistor 2SC2238B(O or Y)
Q720	1	1	HT109682C0	Transistor 2SA968B(O or Y)
D701 ~ D708	8	8	HD20014010	Diode 1SS81
D709	1	1	HD30029010	Zener HZ5ALL
D710	1	1	HD30029010	Zener HZ5ALL
D711	1	1	HD30013010	Zener HZ15-2L
D712	1	1	HD60007100	C.R. Diode 10YD4.5C
				P700-MISCELLANEOUS
J701	1	1	YP06001040	Plug, 3P
J702	1	1	YP06003280	Plug
J703	1	1	YP06003290	Plug
J705	1	1	YL09010190	Terminal
J706	1	1	YL09010190	Terminal
J707	1	1	YL09010190	Terminal
J708	1	1	YL09010190	Terminal
J709	1	1	YJ06002170	Jack, 9P
J710	1	1	YJ06002170	Jack, 9P

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REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION		
				P770-TRANSISTOR CIRCUIT BOARD		
P770	1	1	YF239H0020	P.W. Board, Transistor		
	1		ZZ239H8020	P.W. Board Assembly		
				P770-RESISTORS (All Resistors are ±2% and ¼W)		
R771	1	1	GM21410010	1KΩ		
R772	1	1	GM21410010	1KΩ		
R773	1	1	GM214215G0	21.5Ω		
R774	1	1	GM214215G0	21.5Ω		
R775	1	1	GM214215G0	21.5Ω		
R776	1	1	GM214215G0	21.5Ω		
R778	1	1	GM214215G0	21.5Ω		
R779	1	1	GM214215G0	21.5Ω		
R780	1	1	GM214215G0	21.5Ω		
				P770-SEMICONDUCTORS		
Q771	1	1	HT329871C0	Transistor	2SC2987A(R,Q or P)	
Q772	1	1	HT112271C0	Transistor	2SA1227A(R,Q or P)	
Q773	1	1	HT329871C0	Transistor	2SC2987A(R,Q or P)	
Q774	1	1	HT112271C0	Transistor	2SA1227A(R,Q or P)	
Q775	1	1	HT329871C0	Transistor	2SC2987A(R,Q or P)	
Q776	1	1	HT112271C0	Transistor	2SA1227A(R,Q or P)	
Q777	1	1	HT329871C0	Transistor	2SC2987A(R,Q or P)	
Q778	1	1	HT112271C0	Transistor	2SA1227A(R,Q or P)	
D771	1	1	HV00008080	Varistor	STV-2HW	
				P770-MISCELLANEOUS		
J771	1	1	YP06002150	Plug, 9P		
J772	1	1	YP06002150	Plug, 9P		
				P800-POWER SUPPLY CIRCUIT BOARD		
P800	1	1	YK239H1210	P.W. Board, Power Supply		
	1		ZZ239H1210	P.W. Board Assembly		
				P800-CAPACITORS		
C801	1	1	EC10810010	Elect	1000μF	100V
C802	1	1	EC10810010	Elect	1000μF	100V
C803	1	1	EC10810010	Elect	1000μF	100V
C804	1	1	EC10810010	Elect	1000μF	100V
C805	1	1	DF35101520	Mica	100pF ±5%	
C806	1	1	DF35101520	Mica	100pF ±5%	
CN01	1	1	OA10602510	Elect	10μF	25V
CN02	1	1	OF15222010	Film	2200pF ±5%	
CN03	1	1	OA47602510	Elect	47μF	25V
CN04	1	1	OA47602510	Elect	47μF	25V
CN05	1	1	OA47602510	Elect	47μF	25V
CN06	1	1	OF15102010	Film	1000pF ±5%	
CN21	1	1	OA47405010	Elect	0.47μF	50V
CN22	1	1	OA22605010	Elect	22μF	50V
CN23	1	1	OF15222010	Film	2200pF ±5%	
CX01	1	1	DF16104510	Film	0.1μF ±10%	
CX02	1	1	DF16104510	Film	0.1μF ±10%	

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION		
				P800-RESISTORS (All Resistors are ±2% and ¼W)		
R801	1	1	GM21413330	133KΩ		
R802	1	1	GM21413330	133KΩ		
R803	1	1	GM21446410	4.64KΩ		
R804	1	1	GM21446410	4.64KΩ		
R805	1	1	GM21410010	1KΩ		
R806	1	1	GM21410010	1KΩ		
R807	1	1	GG05223120	22KΩ	±5%	½W
R808	1	1	GG05223120	22KΩ	±5%	½W
R809	1	1	GM21468120	68.1KΩ		
R810	1	1	GM21468120	68.1KΩ		
R811	1	1	GM21417820	17.8KΩ		
R812	1	1	GM21417820	17.8KΩ		
R813	1	1	GM21410030	100KΩ		
R814	1	1	GM21410030	100KΩ		
RN01	1	1	GM21446410	4.64KΩ		
RN02	1	1	GM21468120	68.1KΩ		
RN03	1	1	GM21456220	56.2KΩ		
RN04	1	1	GM21456220	56.2KΩ		
RN05	1	1	GM21456220	56.2KΩ		
RN06	1	1	GM21456220	56.2KΩ		
RN07	1	1	GG05223120	22KΩ	±5%	½W
RN08	1	1	GG05223120	22KΩ	±5%	½W
RN09	1	1	GM21417830	178KΩ		
RN10	1	1	GM21446420	46.4KΩ		
RN11	1	1	GM21446410	4.64KΩ		
RN12	1	1	GM21446420	46.4KΩ		
RN21	1	1	GG05331140	330Ω	±5%	
RN22	1	1	GG05331140	330Ω	±5%	
RN23	1	1	GG05152140	1.5KΩ	±5%	
RN24	1	1	GG05152140	1.5KΩ	±5%	
RN25	1	1	GM21427420	27.4KΩ		
RN26	1	1	GM21427420	27.4KΩ		
RN27	1	1	GM21433220	33.2KΩ		
RN28	1	1	GM21415410	1.54KΩ		
RN29	1	1	GM21433220	33.2KΩ		
RN30	1	1	GM21415410	1.54KΩ		
RN31	1	1	GM21468120	68.1KΩ		
RN32	1	1	GM21410010	1KΩ		
RN34	1	1	GA05561020	560Ω	±5%	2W
RN35	1	1	GA05561020	560Ω	±5%	2W
RX01	1	1	GM21433220	33.2KΩ		
RX02	1	1	GM21433220	33.2KΩ		
RX03	1	1	GD05395140	3.9MΩ	±5%	
RX04	1	1	GD05395140	3.9MΩ	±5%	
RX05	1	1	RA05010240	500Ω(B), Trimming		
RX06	1	1	RA05010240	500Ω(B), Trimming		
RX07	1	1	GM21410000	100Ω		
RX08	1	1	GM21410000	100Ω		
RX09	1	1	GM214681G0	68.1Ω		
RX10	1	1	GM21414720	14.7KΩ		
RX11	1	1	GM21410010	1KΩ		
RX12	1	1	GM21410010	1KΩ		
RX13	1	1	GA05302030	3KΩ	±5%	3W
RX14	1	1	GA05302030	3KΩ	±5%	3W

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REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION		
				P800-SEMICONDUCTORS		
Q801	1	1	HT322382E0	Transistor	2SC2238	
Q802	1	1	HT109682E0	Transistor	2SA968	
Q803	1	1	HT322402A0	Transistor	2SC2240(GR or BL)	
Q804	1	1	HT109702A0	Transistor	2SA970(GR or BL)	
Q805	1	1	HT109702A0	Transistor	2SA970(GR or BL)	
Q806	1	1	HT322402A0	Transistor	2SC2240(GR or BL)	
Q807	1	1	HT322402A0	Transistor	2SC2240(GR or BL)	
Q808	1	1	HT109702A0	Transistor	2SA970(GR or BL)	
QN01	1	1	HC10042050	IC	TA7317P	
QN02	1	1	HT111423A0	Transistor	2SA1142(P,Q or E)	
QN21	1	1	HT322402A0	Transistor	2SC2240(O or Y)	
QN22	1	1	HT109702A0	Transistor	2SA970(O or Y)	
QN23	1	1	HT322402A0	Transistor	2SC2240(O or Y)	
QN24	1	1	HT109702A0	Transistor	2SA970(O or Y)	
QX01	1	1	HT322402A0	Transistor	2SC2240(O or Y)	
QX02	1	1	HT322402A0	Transistor	2SC2240(O or Y)	
QX03	1	1	HC10041050	IC	TA7318P-2	
D801	1	1	HD20028080	Diode	EP01Z	
D802	1	1	HD20028080	Diode	EP01Z	
D803	1	1	HD20028080	Diode	EP01Z	
D804	1	1	HD20028080	Diode	EP01Z	
D805	1	1	HD60002100	C.R. Diode	10YD1.3B	
D806	1	1	HD60002100	C.R. Diode	10YD1.3B	
D807	1	1	HD30009010	Zener	HZ12A2L	
D808	1	1	HD30009010	Zener	HZ12A2L	
DN01	1		HD20014060	Diode	F114D	
DN01		1	HD20028080	Diode	EP01Z	
DN21	1	1	HD20014010	Diode	1SS81	
DN22	1	1	HD20014010	Diode	1SS81	
DN23	1	1	HD30064090	Zener	BZ240	
DN24	1	1	HD30064090	Zener	BZ240	
				P800-MISCELLANEOUS		
J801	1	1	YP06003280	Plug, 3P		
J802	1	1	YP06003280	Plug, 3P		
J803	1	1	YP06003280	Plug, 3P		
J804	1	1	YP06003280	Plug, 3P		
J805	1	1	YP06003290	Plug, 5P		
J806	1	1	YP06003290	Plug, 5P		
J807	1	1	YP06003280	Plug, 3P		
J808	1	1	YJ06002270	Jack, 8P		
LN21	1	1	LY20240150	Relay		
				PN50-SOFT START CIRCUIT BOARD		
PN50	1	1	YK239H1220	P.W. Board, Soft Start		
	1		ZZ239H1220	P.W. Board Assembly		
				PN50-CAPACITORS		
CN51		1	OA47506310	Elect	4.7μF	63V
CN52	1	1	OA47510010	Elect	4.7μF	100V
CN53	1	1	OA47506310	Elect	4.7μF	63V
CN54		1	DF16104510	Film	0.1μF ±10%	

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

REF. DESIG.	Q'TY E	Q'TY F	PART NO.	DESCRIPTION		
				PN50-RESISTORS		
⚠RN51		1	GA05272030	2.7KΩ	±5%	3W
⚠RN52	1	1	GS10047150	4.7Ω	±10%	15W
⚠RN53	1	1	GA05272030	2.7KΩ	±5%	3W
RN54		1	GM21410030	100KΩ	±2%	¼W
RN55		1	GM21410000	100Ω	±2%	¼W
RN56	1		GM21468120	68.1KΩ	±2%	¼W
RN56		1	GM21446420	46.4KΩ	±2%	¼W
RN57		1	GM21410000	100Ω	±2%	¼W
				PN50-SEMICONDUCTORS		
⚠QN51		1	HW10001320	Photo Unit		
QN53		1	HT322402A0	Transistor	2SC2240(GR or BL)	
QN54	1	1	HT327052A0	Transistor	2SC2705(O or Y)	
⚠DN51		1	HD20011010	Diode	W06C	
⚠DN52		1	HD20011010	Diode	W06C	
⚠DN53		1	HD20011010	Diode	W06C	
⚠DN54		1	HD20011010	Diode	W06C	
⚠DN55		1	HD20014010	Diode	1SS81	
⚠DN56	1	1	HD20011010	Diode	W06C	
⚠DN57	1	1	HD20011010	Diode	W06C	
⚠DN58	1	1	HD20011010	Diode	W06C	
⚠DN59	1	1	HD20011010	Diode	W06C	
⚠DN60	1	1	HD30064090	Zener	BZ-240	
⚠DN61	1	1	HD30064090	Zener	BZ-240	
DN62	1	1	HD20014010	Diode	1SS81	
DN63	1	1	HD30064090	Zener	BZ-240	
				PN50-MISCELLANEOUS		
⚠LN51		1	LY10480020	Relay, TV48D1-F		
⚠LN52	1	1	LY10480020	Relay, TV48D1-F		
FN51	6	6	FC90050010	Ferrite Core , BF02		
				PS00-METER SWITCH CIRCUIT BOARD		
PS00	1	1	YH239H2220	P.W. Board, Meter Switch		
	1		ZZ239H8220	P.W. Board Assembly		
JS01	1	1	YP10001980	Plug, 2P		
SS01	1	1	SP02011170	Push Switch, Meter		
				PZ01-METER LAMP CIRCUIT BOARD		
PZ01	1	1	YH239H2210	P.W. Board, Meter Lamp		
	1		ZZ239H8210	P.W. Board Assembly		
JZ01 ~ JZ04	4	4	YJ02000780	Jack		
VZ01 ~ VZ04	4	4	IN10080600	Lamp	300mA 8V	
VZ05	1	1	IN10080340	Lamp	60mA 8V	
WZ01	1	1	YU08540260	Jumper Lead, 8P		

NOTE ON SAFETY:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

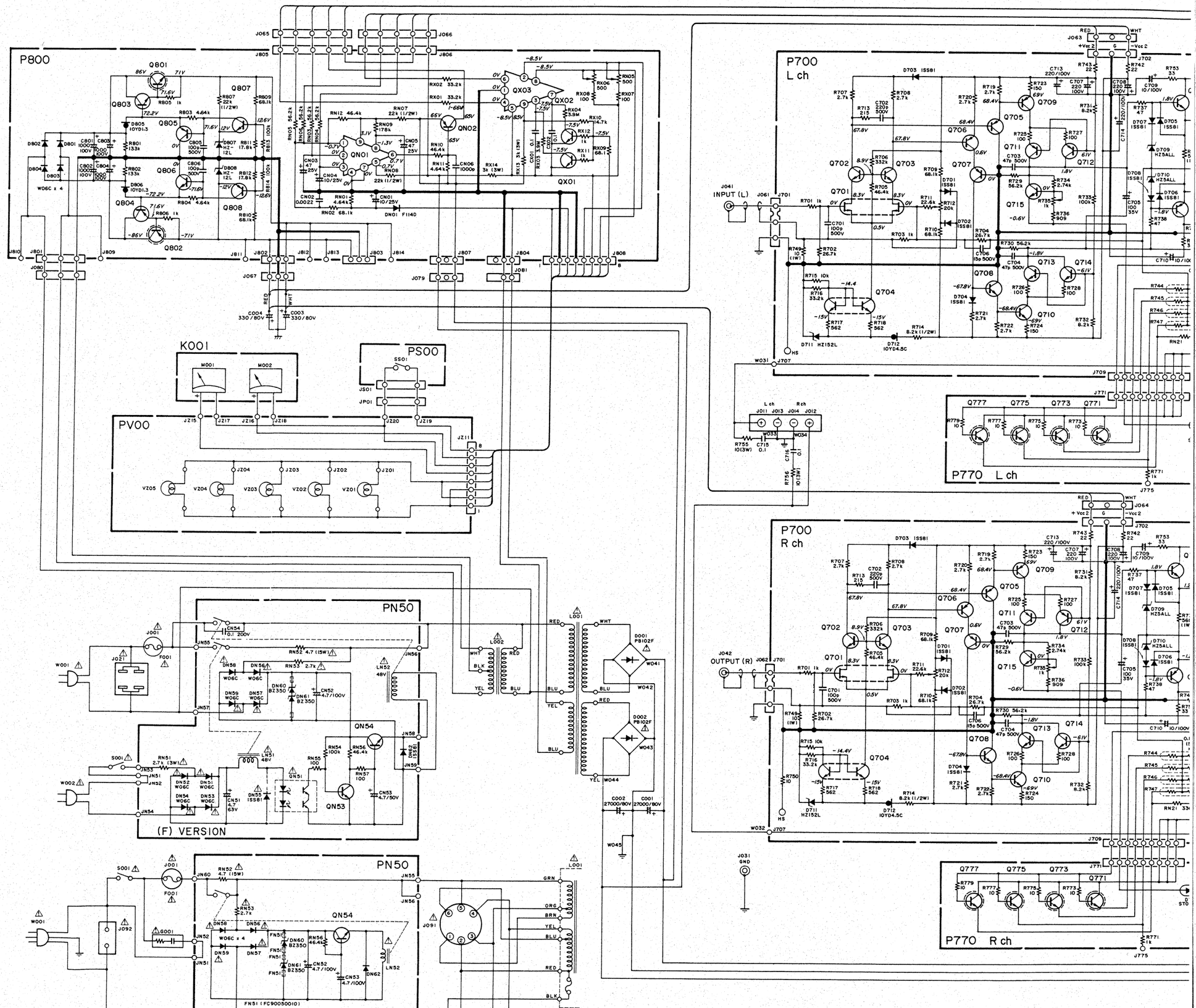
11. TECHNICAL SPECIFICATIONS

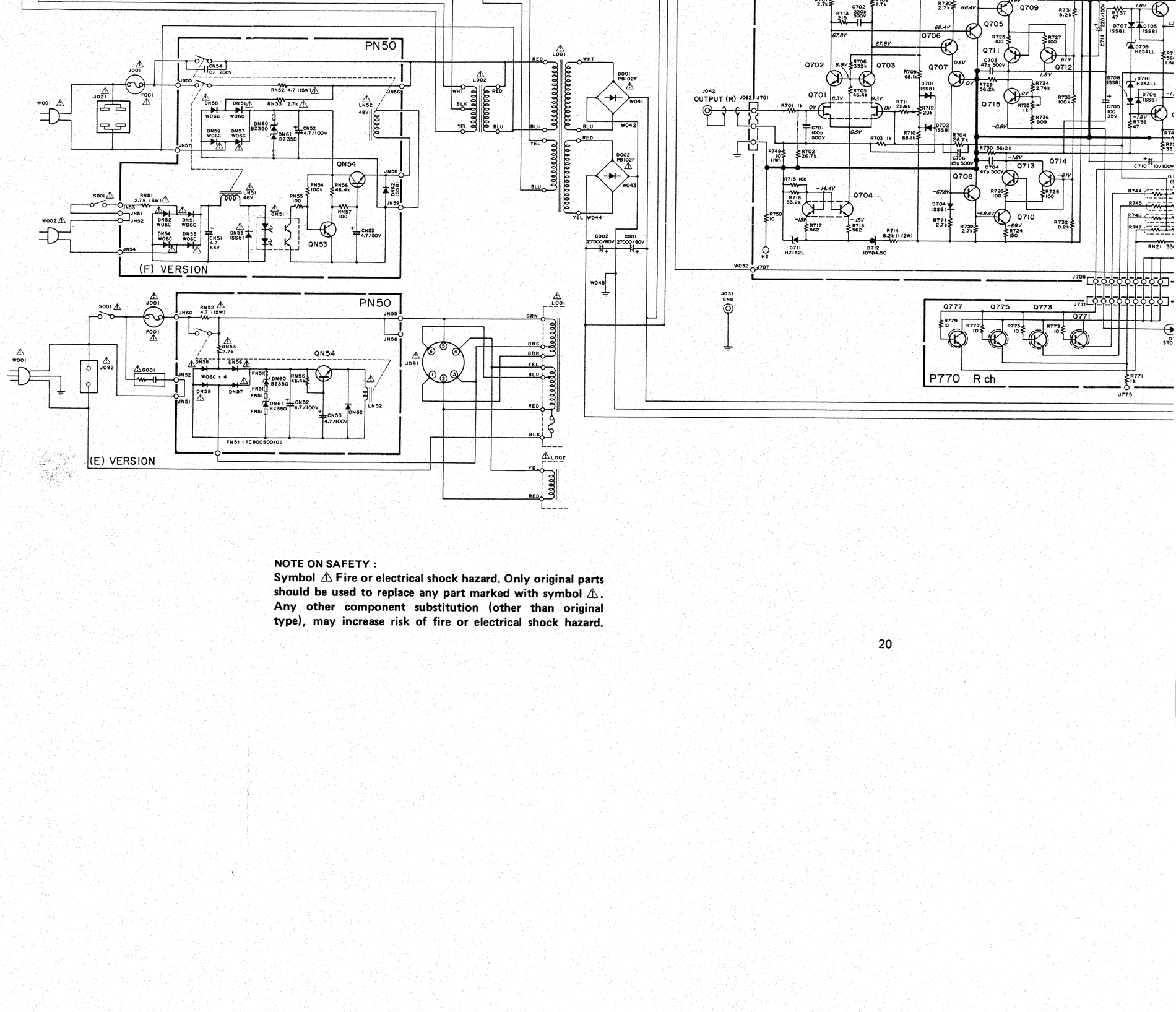
Rated Power Output (20 — 20 kHz)	200 W x 2 (8 ohms) 300 W x 2 (4 ohms)
Total Harmonic Distortion (20 — 20 kHz, 8 ohms load)	Less than 0.008%
Intermodulation Distortion	Less than 0.008%
Frequency Response (10 — 100 kHz)	+0, —0.2 dB
Input Sensitivity/Impedance	1.5 V/22 kohms
Damping Factor (8 ohms load)	Better than 100
Signal-to-Noise Ratio (IHF-A Curve)	120 dB
Power Requirements	100V 50/60 Hz
Power Consumption	400 W
Dimensions	
Panel Width	454 mm
Panel Height	200 mm
Depth	446 mm
Weight	30 kg

Specifications and apperance are subject to change for modification without notice.

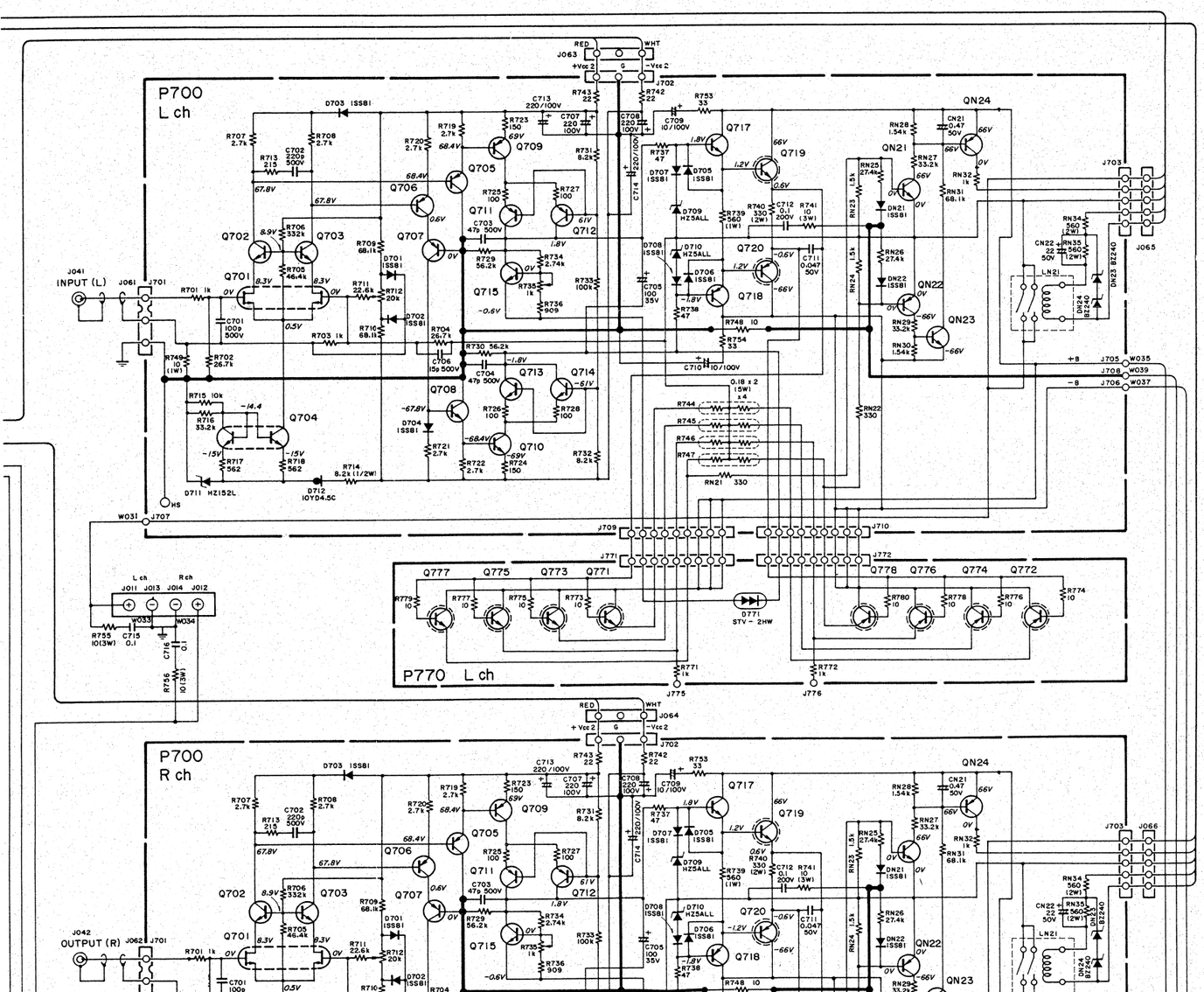
MEMORANDUM

12. SCHEMATIC DIAGRAM





NOTE ON SAFETY :
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.



Q713,Q714,QN54
HT327052A0
2SC2705

QX01,QX02,Q702,Q703
Q708,Q710,Q803,Q806
Q807,QN21,QN23,QN53,Q715
HT322402A0
2SC2240

Q801
HT322382E0
2SC2238

Q719
HT322382C0
2SC2238B

Q705～Q707,Q709,Q804
Q805,Q808,QN24,QN22
HT109702A0
2SA970

Q802
HT109682E0
2SA968

QN02,Q720
HT109682C0
2SA968B

QN01
HC10042050
TA7317P

QX03
HC10041050
TA7318P

Q701
HF203892A0
2SK389

Q704
HT333812A0
2SC3381

Q711,Q712
HT111452A0
2SA1145

Q717
HT326823A0
2SC2682

Q718
HT111423A0
2SA1142

Q771,Q773,Q775,Q777
HT329871C0
2SC2987A

Q772,Q774,Q776,Q778
HT112271C0
2SA1227A

DN01,D801∿D804
HD20028080
EP01Z

D711
HD30013010
HZ152L

D712
HD60007100
10YD4.5C

D709,D710
HD30029010
HZ5ALL

DN23,DN24
HD30064090
BZ240

D771
HV00008080
STV-2HW

BOTTOM VIEW
C1 SUB C2
B1 E1 E2 B2

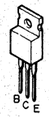
C1 B1 B2 C2
E1 E2

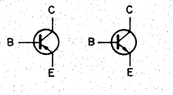
2SC3381

BOTTOM VIEW
G1 SUB G2
D1 S1 S2 D2

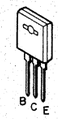
D1 D2
G1 G2
S1 S2

2SK389

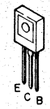




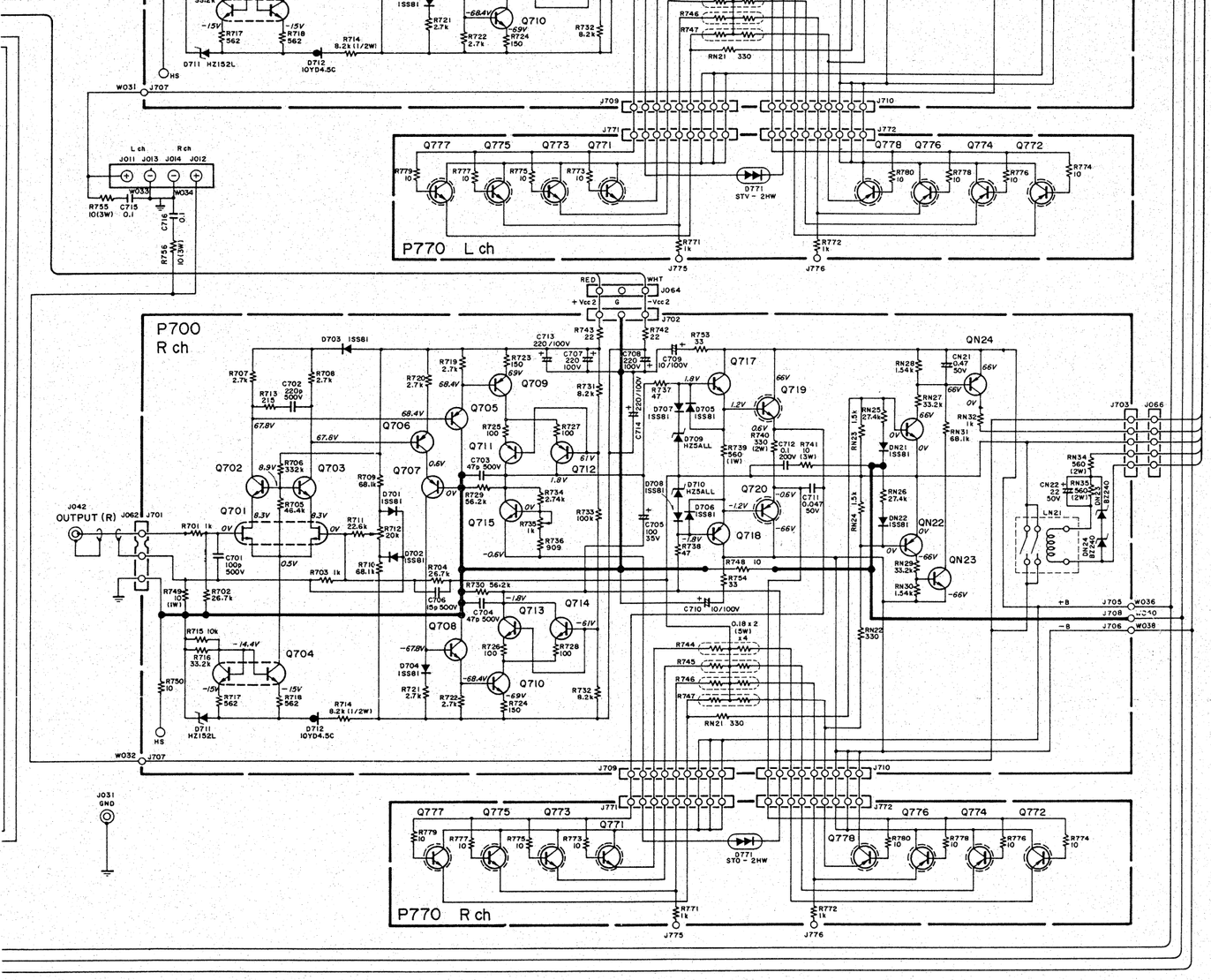
2SA968 2SC2238
2SA968(B) 2SC2238(B)



2SA1227(A)
2SC2987(A)



2SC2682
2SA1142



QN02,Q720
HT109682C0
2SA968

QN01
HC10042050
TA7317P

QX03
HC10041050
TA7318P

Q701
HF203892A0
2SK389

Q704
HT333812A0
2SC3381

Q711,Q712
HT111452A0
2SA1145

Q717
HT326823A0
2SC2682

Q718
HT111423A0
2SA1142

Q771,Q773,Q775,Q777
HT329871C0
2SC2987A

Q772,Q774,Q776,Q778
HT112271C0
2SA1227A

QN51
HW10001320
PC627

DN51∿DN54
DN56∿DN59
HD20011010
W06C

DN60,DN61
HD30065090
BZ280

DN21,DN22,DN55,DN62
D701∼D708
HD20014010
1SS81

D807,D808
HD30009010
HZ-12L

D805,D806
HD60002100
10YD1.3

BOTTOM VIEW

C1 SUB C2
B1 E1 E2 B2

2SA1227(A)
2SC2987(A)

C1 B1 B2 C2
E1 E2

2SC3381

BOTTOM VIEW

G1 SUB G2
D1 S1 S2 D2

2SK389

2SC2682
2SA1142

2SA970 2SC2240 2SA1145 2SC2705

SIDE VIEW

TA7317P
TA7318P

Components and wiring are subject to change for modification without notice.

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